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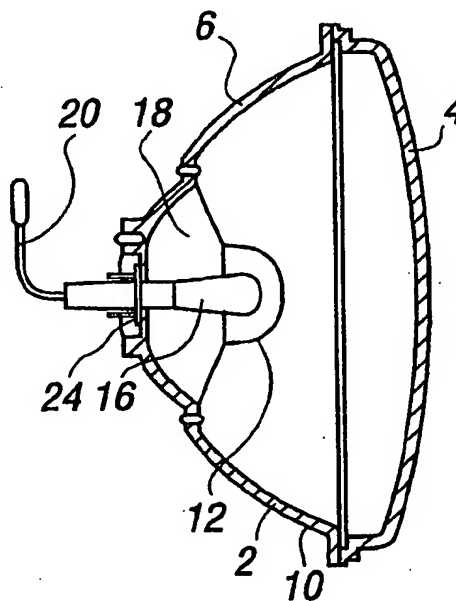
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(54) Halogen light unit

(57) The invention of this application relates to the ability to provide a halogen lamp unit, typically for use in an underwater environment such as a swimming pool, which provides the advantages of using halogen bulbs. In one aspect of the invention the halogen bulb unit can be provided of a similar shape to the conventional type of light unit currently used in swimming pools which is referred to as a Par lamp. The similar shape allows the halogen lamp units to be fitted in substitution of a Par lamp unit in the same mounting and to provide the required watertight seal between the halogen lamp unit and the original mounting thus overcoming the need to undertake expensive refitting of the same. The bulb unit for the halogen lamp unit is also a feature of the invention which allows the bulb to be replaced and the bulb unit can be fitted in the lamp unit without the need for the bulb to be electrically connected in situ at the time of fitting.

**FIG. 1B****EP 1 083 384 A1**

Description

[0001] The invention which is the subject of this application is a Halogen light unit and means of converting a standard light fitting into a Halogen light unit, and particularly, but not exclusively, improvement to a light fitting of the type used in underwater environments such as in swimming pools and the like.

[0002] At the present time the lights used for underwater fixings such as in the walls or floors of underwater environments such as swimming pools conventionally comprise a recess or aperture in the wall or floor or a panel forming the same, a housing which fits into the recess and forms a waterproof electrically connected housing into which an inner housing with a lamp known as a Par Lamp which comprises an outer lens, sealed to a back plate in which is housed the bulb and a reflector is fitted, to form the light unit. The Par Lamps typically include a 300 watt element of the conventional type.

[0003] The development of Halogen light bulbs is a relatively recent development and there are advantages to be gained by using the same. One advantage is that the life of the bulb is longer than conventional bulbs and this provides savings in the number of bulb replacements required and also in the number of times the light fittings have to be accessed to replace the bulbs, which, when one considers that the light fittings are under water, can be time consuming and expensive. A further advantage is that the power consumption of halogen light bulbs is considerably less than with conventional light bulbs and can be a third of the power consumption of the conventional bulbs. This therefore means that the running costs of the lights are considerably reduced and that the lights run at lower temperatures and therefore reduce the risk of overheating as with the conventional lights which are required to be cooled by the water in which they are positioned.

[0004] There are therefore clear advantages as to why the halogen light bulbs should be used but at the present time, in order to use the same it is necessary to remove and discard the existing Par lamp unit and inner housing and then purchase new, relatively expensive, halogen lamps and inner housings and then fit the same in the wall or floor recess of the swimming pool. This expensive operation therefore tends to negate the advantages which can be obtained from using halogen light bulbs. Another alternative is to remove the Par lamp, place a glass plate over the inner housing opening and then mount the halogen bulb from the rear of the inner housing but this is again time consuming and expensive to achieve.

[0005] The aim of the present invention is to provide a means for converting existing conventional light units so that the same can be formed into a halogen light unit and obtain the desired advantages while minimising the time and cost to do so.

[0006] In a first aspect of the invention there is provided a halogen lamp unit for underwater use, said lamp

unit comprising a housing formed from a lens at the front and a back plate and mounted within the housing a reflector and a light bulb unit characterised in that the light bulb unit incorporates a halogen light bulb in a holder held in position by retaining means in engagement with the back plate and means allowing connection with the electricity supply with the lamp unit held in sealing engagement with a light fitting.

[0007] The halogen lamp unit is typically formed with the same external diameter as the conventional Par lamp, i.e. to allow the same to be fitted into the light fitting into which the Par lamp fits. It is also preferred that the halogen lamp unit is shaped so as to be able to lie within the fitting and form a seal with sealing means provided on the fitting so as to prevent contact between the water and electrical connections.

[0008] Typically the halogen bulb unit includes retaining means which comprise a plate which locates in a similarly outlined aperture in the back plate of the lamp and said unit is releasably engaged with the back plate to allow removal and replacement of the bulb. The bulb unit typically also includes a shield mounted to the front of the bulb to obtain the required pattern of light.

[0009] It is a further aspect of the invention that the Halogen light bulb unit incorporates the light bulb with connecting pins held in contact with a connecting socket and said socket and bulb are formed as an integral unit with connection leads depending therefrom. This means that the bulb unit can be placed and secured in position in the lamp unit without the need for the bulb to be directly electrically connected. All that is required is for the connecting leads to be connected to the external electricity supply. This makes the connection of the halogen light bulb unit significantly easier than is conventionally the case where the light bulb is required to be pressed into the socket to connect the pins with the socket.

[0010] In a further aspect of the invention there is provided a method for converting a Par Lamp light unit to a Halogen light unit by the method of removing and disconnecting the Par lamp unit from the existing fitting or mounting of the conventional light unit and replacing the same with a Halogen lamp unit with a halogen light bulb unit fitted therein and said lamp unit of a shape to allow the same to fit in the existing fitting and form a seal with the same and electrically connecting the same to form the halogen light unit.

[0011] This method allows the existing light unit mountings and housings to be continued to be used for the halogen lamp unit and therefore represents considerable time and cost savings.

[0012] Typically the halogen bulb is releasably mounted via engagement means with the back plate of the lamp unit to allow removal and replacement of the same.

[0013] A specific embodiment of the invention is now described with reference to the accompanying drawings wherein;

Figures 1A-1D illustrate a halogen lamp unit ac-

according to the invention; and

Figures 2A-B illustrate in schematic fashion the steps taken to convert a Par Lamp light unit to a Halogen light unit incorporating a halogen lamp of the type shown in Figures 1A-C.

[0014] Referring firstly to Figures 1A-D there is shown a halogen lamp unit according to the invention. The lamp 2 comprises a front lens 4, sealed to a back plate 6 to form a housing. The inside face of the back plate is formed with material to act as a reflector 10 and there is also mounted in the housing a shield 12 which is mounted to lie to the front of the Halogen bulb 16 as shown in Figure 1B.

[0015] The Halogen bulb is provided as part of a light bulb unit 18 shown in detail in Figure 1D which comprises the light bulb 19 held in a holder 21 which includes connecting pins 23 in connection with a socket 25 and formed as an integral unit with connecting wires 20 so that only the wires 20 need to be connected to the electricity supply and the bulb is already inserted and provided as an integral part of the bulb unit to make the fitting of the same easier in situ. The holder 21 also includes a plate 24 which is formed with location indents which match with protrusions formed on the aperture 22 in the back plate 6 to ensure the correct orientation of the light bulb in the housing. The light bulb is retained in position by engagement means 26 which engage in location with the back plate to lock the bulb in position. The engagement means 26 can be selectively released to allow changeover of the bulb as required.

[0016] Figures 2A-2B illustrate the manner in which the halogen lamp of Figures 1A and B can be fitted to convert an existing light unit to a halogen light unit. Figure 2A illustrates a convention Par lamp 40 connected via cable 42 to an electricity supply 44 to the rear of a wall 46. The lamp 40 is shown with a front clamping ring 41 and is mounted in a fitting which in this form is an inner housing 48 which is in turn located in an outer housing 49 which is fitted in the wall. The Par lamp is normally positioned in the inner housing and forms a seal with an o-ring 51, as shown in Figure 2B which is a cross section through the inner housing, which prevents the water which surrounds the front of the lamp unit to cool the same, from passing to the electrical connections 43. To remove the par lamp 40 to convert the light unit to a Halogen light unit, front clamping ring 41 is removed from the inner housing 48 as shown by arrow 50 in Figure 2A. The electrical connections 43 are disconnected and the lamp unit 40 is removed. The same is then replaced with a halogen lamp 2 of the type shown in Figures 1A-1D with the electrical connections 20 connected to the cable 42. The lamp 2 is then placed into position in the inner housing 48 and as it is provided to lie in the same area as the lamp unit 40, forms a seal with the o-ring 51 without the need for any alteration of the inner housing 48. With the halogen lamp unit in po-

sition the front clamping ring 41 is applied to clamp the lamp unit 2 in position in the inner housing which is placed in the outer housing and using the screws to secure the housing together. Thus it will be appreciated that the present invention provides a means whereby existing light unit fittings can be used and converted to halogen light units by the removal of the existing lamp unit and introduction of a halogen lamp unit in accordance with the present invention. This allows the advantages of using Halogen lamps to be obtained while minimising the costs of installing the same.

[0017] It should be appreciated that while the main advantage envisaged of this invention is the ability to convert conventional underwater light units to Halogen light units, the concept of the invention can be of use in the conversion of any conventional light unit to a Halogen light unit and it should be appreciated that this patent application should be read and interpreted in this manner.

Claims

1. A halogen lamp unit for underwater use, said lamp unit comprising a housing formed with a lens at the front, and a back plate and, mounted within the housing a reflector and a bulb unit, characterised in that the bulb unit incorporates a halogen light bulb in a holder held in position by a retaining means in engagement with the back plate and means allowing connection with the electricity supply with the lamp unit held in sealing engagement with a light fitting.
2. A halogen lamp unit according to claim 1 wherein the same can be fitted into a light fitting provided for a conventional Par lamp unit.
3. A halogen lamp unit according to claim 2 wherein the lamp unit is fitted and shaped to lie within and form a seal with the sealing means provided on the light fitting.
4. A halogen lamp unit according to claim 1 wherein the bulb unit includes retaining means which comprise a plate which locates with an aperture in the back plate of the lamp unit.
5. A halogen lamp unit according to claim 4 wherein the bulb unit is releasably engaged with the back plate of the lamp unit to allow removal and replacement of the bulb unit for replacement of the halogen bulb.
6. A halogen lamp unit according to claim 4 wherein the bulb unit includes a shield mounted at the front of the bulb to determine the pattern of light from the lamp unit.

7. A halogen lamp bulb unit incorporating a halogen light bulb with connecting pins held in contact with a connecting socket and said socket and bulb form the bulb unit with connecting means depending therefrom. 5
8. A halogen bulb unit according to claim 7 wherein the bulb unit can be placed and secured in position in a lamp housing without the need for the bulb to be directly electrically connected in situ. 10
9. A method for converting an underwater Par lamp fitting to a halogen lamp fitting by removing and disconnecting the Par lamp unit from the existing fitting, replacing the same with a lamp unit with a halogen light bulb unit fitted therein and said light bulb unit of a shape to allow the same to fit in the existing fitting and form a watertight seal with the same, and electrically connecting the halogen lamp fitting to form the halogen lamp fitting. 15 20

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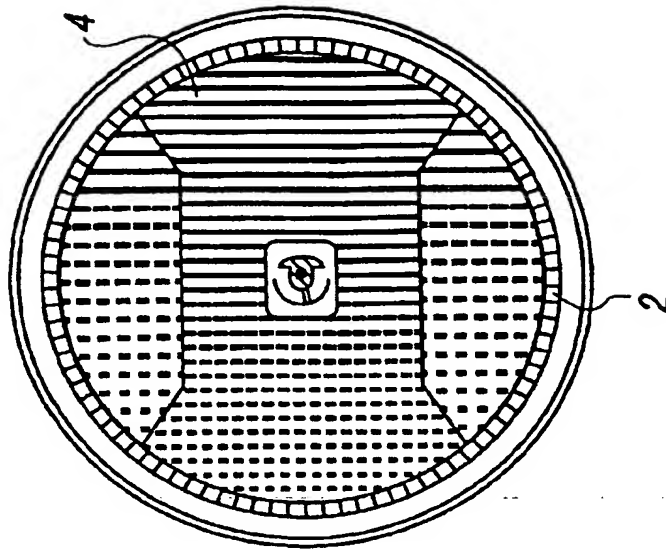


FIG. 1C

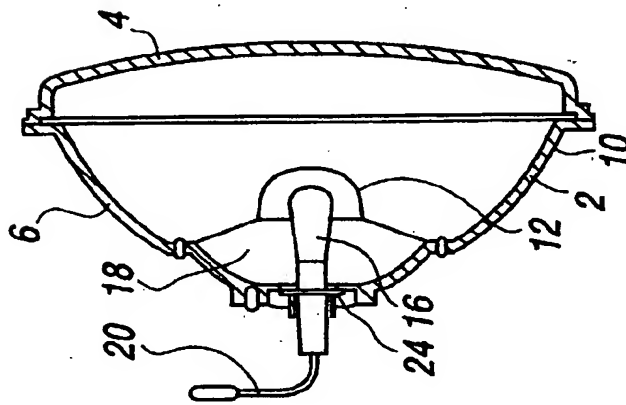


FIG. 1B

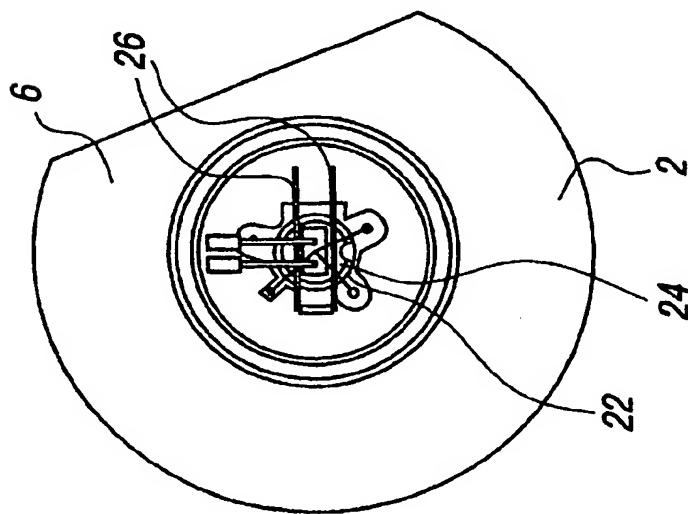


FIG. 1A

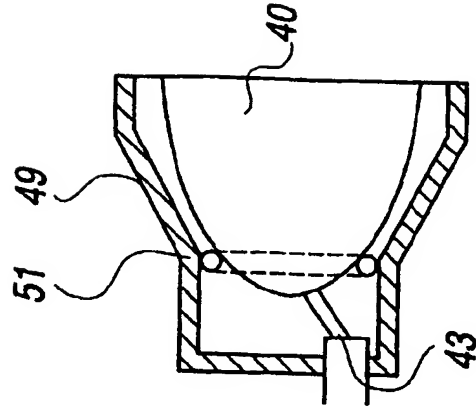


FIG. 2B

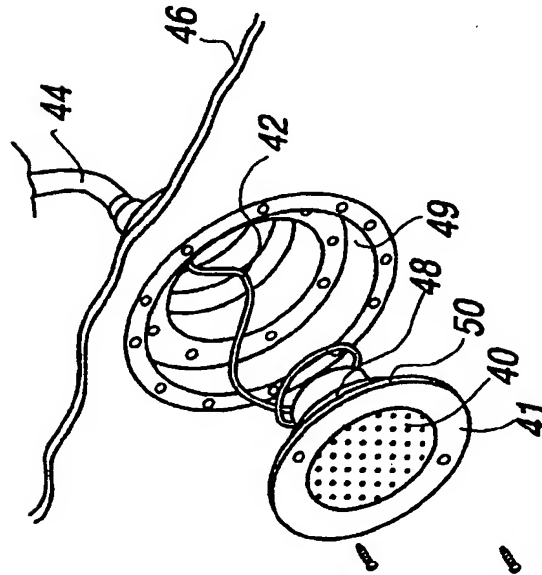


FIG. 2A

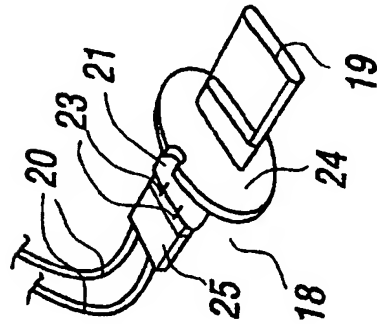


FIG. 1D



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EUROPEAN SEARCH REPORT

Application Number
EP 99 11 7836

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 800 041 A (POGGI BRYAN) 1 September 1998 (1998-09-01) * column 3, line 39 - line 45 * * column 4, line 48 - column 5, line 35 * * figures 1-3 *	1, 4, 5	F21V19/00 F21S8/02 //F21W131:401
A	DE 32 32 949 A (OASE PUMPEN) 8 March 1984 (1984-03-08) * page 8, line 11 - line 20 * * figure 1 *	1, 2, 4, 5, 9	
A	EP 0 188 366 A (NOVETTA LTD) 23 July 1986 (1986-07-23) * page 3, line 17 - page 4, line 33 * * figures *	1-5, 7	
X	FR 2 702 890 A (VLM SPA) 23 September 1994 (1994-09-23) * page 2, line 24 - line 37 * * figure 1 *	7	
A	US 5 658 074 A (GURITZ MICHAEL LEE) 19 August 1997 (1997-08-19) * column 1, line 38 - column 2, line 37 * * figures 2B, 3B *	8	
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Place of search THE HAGUE		Date of completion of the search 31 January 2000	Examiner Clabaut, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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